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Common and Conspicuous Algæ of Montana.

By F. W. Anderson and F. D. Kelsey.

Batrachospermum moniliforme, Roth. Common in cool springs and streams of the mountains and plains throughout the State. Extremely variable in the gross shape, size and color, as well as in microscopic characters. The plant may be found in favorable situations nearly all the year. It arises from a slippery substratum covering the surface of submerged sticks and stones, and mixed more or less evidently with carbonate of lime: this substratum resembles closely to the unaided eye, the expanded, active plasmodium of some myxogaster. The moniliform stems arising from this are usually clustered or gregarious. Specimens, varying from one to ten inches long, and from nearly simple to copiously branched, may be collected in good fruit from May until September, according to locality. The fruit glomerules frequently send out stems which have, under personal observation, grown to a length of nearly two inches, branching several times, and starting whorls of lateral branch nodes, the filaments from which became from one to four cells long. Is it not possible that a fruit glomerule may sometimes separate from the parent plant, drift into a sheltered place and there send out branches which finally develop into a perfect plant, without any further sexual action, while the glomerule itself becomes the thickened foot holding the plant in position? The first three varieties of these species, as given in Wolle's Fresh-Water Algæ, p. 57, may all be found with the type with us, according to the locality, and there seems to be no necessity for their separation.

We may expect to find *B. vagum*, Ag., or one of its forms, as Dr. C. L. Anderson has found a variety in California. Dr.

Anderson said in a letter several years ago to one of the writers, that he had never seen a typical specimen of *B. vagum* from this country, but had specimens from Europe. But Mr. Wolle, in Fresh-Water Algæ, on p. 57, says that typical specimens are to be found in Maine and Canada.

Chantransia violacea, Kg. var. KELSEYI. Anderson, new var.

Tufts dense, frequently hemispherical, usually solitary, blackish-green, glossy, drying dull on paper, and fading to dark olivaceous; one to about two lines high. Filaments straight or slightly curved from the base, smooth, dilute green to pale olive green; branches ascending or almost erect, the ends obtuse, frequently rounded and slightly swollen, and occasionally somewhat elongated, 4-8 μ wide, by 33-55 μ long. Fertile branches commonly shorter; carpogons 6-10 μ wide by 10-14 μ long. On the wet wood-work of a mill race, and on stones in shallow water, Great Falls, Montana, March, 1887.*

Enteromorpha intestinalis (Linn.), Link, var. *prolifera*, Ag. Very abundant in the Upper Missouri River, and clear, cold mountain streams tributary thereto. Found in these streams at an altitude of 6,000 feet. At first filamentose, arising from a densely interwoven base formed of similiar threads attached to stones, finally becoming inflated and sparingly branched, rising to the surface and floating in free masses. The individual fronds frequently attain a length of eight feet. May be found all the year, but most abundant in spring and summer. See Wolle's Fresh-Water Algæ, p. 338.

Draparnaldia glomerata, Ag. Abundant in all of our clearer streams and springs, attached to sticks and stones. At first bright green, and forming in roundish masses, firmly attached to the substratum, after the manner of a Nostoc; later becoming watery by the partial dissolution of the amorphorus gelatinous sheathing mass, and floating free on the surface of the water, or caught around the stems or leaves of submerged living plants. June to October.

Draparnaldia plumosa, Ag. A small but remarkably robust specimen was found attached to a small pebble in an arm of the

*The general appearance of this plant is similiar to that of small specimens of *Tolypothrix pulchra*, Kg., which it was taken to be, until last year, when I had occasion to compare my species of Tolypothrix microscopically, and made this discovery.—A.

furiously flowing Giant Spring on the bank of the Missouri River, near Great Falls. Several main stems arose from a common swollen foot, and branched freely above; a dark sap-green when taken from the water, but drying considerably lighter on paper. This is the only specimen, thus far, reported from Montana, and, like specimens collected by Dr. C. L. Anderson, in California, and others from Connecticut, collected by Dr. W. A. Setchell, it is very distinct in habit of growth and in general appearance from any of our specimens of *D. glomerata*, in which latter the stems and branches are all immersed in a gelatinous substance, more or less firm and dense, according to the age of the plant, which binds them into a glomerule varying from the size of a small pea up to that of an English walnut. In *D. plumosa* the plant has the slippery envelope so modified as to leave every part free, and the general habit of growth in our specimen was similiar to that of reduced forms of *Batrachospermum moniliforme*, but the other specimens referred to were weaker and more diffuse. Giant Spring, banks of the Upper Missouri River, near Great Falls, Montana, September, 1885.

Stigeoclonium tenue, Kg. Habit of growth and general appearance similiar to that of small specimens of *Cladophora callicoma*, but of a brighter green color. Common all over the State. In sheltered nooks it may be found flourishing in winter, but most abundant from the middle of May till the middle of July, and by the end of the month it has pretty well disappeared.

Chætophora pisiformis (Roth), Ag. Found but once and then attached to dead twigs in a pool of cold water, collected from a spring in a dark ravine, at an altitude of about 7,000 feet, in the Belt Mountains, July, 1886. In these specimens, the thallus was half an inch in diameter, and sub-globose.

Chætophora endiviæfolia, Ag. This beautiful species is common all over the State, but especially so in those parts of the Upper Missouri River, and its more sluggish tributaries having muddy bottoms. It grows chiefly in shallow water near the shore, and is at first attached to stones. May be found in winter, but is at its best during July and August.

Cladophora fracta, Kg., var. *gossypina*, Kg. Common in ponds, sloughs, and in slow-flowing spring water somewhat impreg-

nated with alkali. At first attached to the substratum; finally rising and floating free in large, silky, yellowish masses. The individual filaments are very sparingly branched, and *en masse* look more like a *Spirogyra* than like a *Cladophora*. July to September, but at its best in the middle of August.

Cladophora crispata, Kg. Very abundant in shallow ponds and sloughs bordering the Prickly Pear Creek in the Prickly Pear Cañon. Floating in dark green, spongy, elastic masses of less or more curly, interwoven, and much-branched filaments, which spring out to their normal form after the water is squeezed from them, just as sponges do. Collected but once, and then in a luxuriant condition, April 19, 1887.

Cladophora canalicularis, Kg. This common species was collected but once and then at the first rapids of the Great Falls of the Missouri River. The specimens had been cast ashore. They were about ten inches long, strict and rather brittle; the lower half was very dense and compact, being made up of shorter stems and branches arising from the hard, blackish, somewhat calcareous foot. Filaments pale yellow. October, 1886.

Cladophora callicoma, Kg. Plentiful in the rapids of the Upper Missouri River, in the vicinity of the city of Great Falls. This is probably one of the most beautiful species of the genus; but is usually so large and so copiously and intricately branched that a perfect specimen cannot be arranged on a standard-sized herbarium sheet. Forming in ropes three to ten feet long, gracefully undulating in the flowing water and waving its beautiful lateral branches. See Wolle's Fresh-Water Algæ, p. 339. This species was first observed by us in August, 1884—when it was very abundant. Then a dam was built across the river just above the rapids and the disturbance caused the destruction of the plants. In 1886 it reappeared and although excellent specimens were collected as late as October, they did not compare with the luxurient growth of 1884. The plant is now regaining its vigor and may be found in good condition from July until the end of October.

Cladophora glomerata, Kg. Common throughout the state. May be found in good condition from the middle of June till the end of September. The following varieties also occur:

Var. *genuina*, Kirch, is plentiful in all pure, cool, rapid waters of the state; found in the mountain streams, at the altitude of 8,000 feet. Same duration as the species.

Var. FILAMENTOSA, Anders. and Kelsey n. var. Similar to the last but easily distinguished by the more or less numerous elongated simple or sub-simple filaments rising above the other branches and crowned by several to many short-fasciculate to sub-corymbose penicillate branchlets. Plants bright green, 1 to 6 inches high, arising from a calcareous foot, which adheres strongly to the rocky substratum. Cataracts of the Missouri and other rivers of the state; also at Niagara Falls (Wolle), June to October.

Var. *pumila*, Bailey. Frequent on wet wood-work of flumes and races at the city of Great Falls. This pretty little variety grows like a miniature bush, dark green in color, changing with age to a dull dirty green. None of our specimens are over half an inch high. August to November.

Vaucheria sericea, Lyngb. Abundant everywhere. Delights in covering the flat stones and bed-rock of turbulent streams, appearing like big patches of a dense, bright green turf. Also grows in the mud along the margins of springs. All the year round, but at its best from July to December.

Vaucheria sessilis (Vauch), D.C. var. *cæspitosa* (Vauch), Ag. Very common on muddy bottoms of irrigating ditches and on the wet ground bordering creeks and springs. July to October.

Volvox globator, Linn. This curious and beautiful plant is found abundantly in ponds and slow streams throughout the state, all summer.

Protococcus viridis, Ag. and several forms or varieties (?) found everywhere on trees, logs and on the stems of dead herbaceous plants. One form is particularly partial to charred wood of any kind, on which it forms into numerous families by sub-division, appearing like roundish grains or masses of greenish pollen to the unaided eye.

Hydrurus fœtidus (Vill.), Kirch. Very abundant in the Prickly Pear Creek, in Prickly Pear Cañon. Collected but once, April 19, 1887. Specimens vigorous. As many as twenty-seven distinct main stems were counted rising from a common disk of attachment. Plants from six to eighteen inches long,

olivaceous, very slippery and of a rank odor—like some of the offensively strong-smelling marine algæ. Flavor like kelp, but stronger and nauseating.

Var. *Ducluzelii*, Ag. has been found only in the Giant Spring, near Great Falls. The first specimens were collected September 28, 1885, in a very rapid arm of the spring. They were plentifully attached to imbedded stones. The largest specimen was three and a half inches high and none have been found so large since; the average height seems to be from an inch and a half to two inches; very dark green and olive-tinged, which shows more decidedly in dried specimens. This plant seems to appear only every other year; from August to October.

In connection with this form attention is called to page 337 of Wolle's Fresh-Water Algæ of the United States, whereon is mentioned a plant that might possibly be a form of *Gelidium corneum*, Lam. Only a scanty supply was collected, although it was fairly abundant at the time. This form has been carefully examined by Drs. Setchell and Farlow and by us, and the conclusion now is that it is merely a condition of *H. fœtidus* var. *Ducluzelii*, in which the lateral branches, usually so liberally clothing the main stem, have not been developed. The microscopic structure of the two forms is practically the same.

TETRASPORA GIGANTEA, Anders. and Kelsey, n. sp. Thallus attached to stones by the attenuate base, tubular or sometimes filled with an amorphous semi-fluid jelly which contains a few cells or none; cylindrical; end slightly tapering and rounded, or extended gradually into a long, slender, rounded point, one-eighth of an inch in diameter; one to ten feet long, diameter from a slender thread to an inch and a half in the broad part, according to length and age of thallus: Cells 10–17μ diameter, average size about 16μ. Thallus bright green, becoming dilute green with age, smooth, very slippery, and easily ruptured.

This species differs from *Tetraspora cylindrica*, Ag. in its much greater size, in its remarkably conspicuous, gregarious habit, in the attenuate base and rounded apex and in the tendency to form cells throughout the diameter of the thallus as well as in having for a constant habitat the swift, turbulent mountain streams. The diameter of the cells is about the same in both, sometimes a little larger in ours, but the other features are so

different that we feel safe in describing it under the foregoing name. Belt River in the cañon and in other streams of the Belt mountains and main range of the Rockies, from 5,000 to 8,000 feet altitude. June to September. See Wolle's Fresh-Water Algæ of the United States, p. 339.

T. GIGANTEA var. SOLIDA, Anders. and Kelsey n. var.

Thallus firmly attached by a broad or rarely narrowed base, usually tapering from the base to the blunt point; firm, solid throughout, or hollow only below, pliable and slightly elastic, can be cut in slices with a penknife, and can be carried in the hand and trailed along the ground like a quirt; usually covered outside with silica or possibly fine sand; glaucus outside, dark green inside and paler towards the centre, where the cells are not so crowded; one to six feet long, with a diameter of one inch or less at the base.

This remarkable alga invariably grows on flat bed rock in the "dead water" just below the ripples, and near the edge of the stream. Like the species, may be found from June to September; Belt River, in the cañon, Belt Mountains.

Tetraspora cylindrica, Ag. Occasionally found in rills from slow-flowing springs. Slender, attenuate pointed, six inches to a foot long, bright green, slippery; often attached to dead submerged twigs. July to October.

Tetraspora lubrica, Ag. Very common in quiet springs and slow streams throughout the State. A quite variable species. June to October.

Spirogyra quinina (Ag.), Kg. Common everywhere in a vegetative condition, all the year round. We have neither caught it in conjugation nor in fruit as yet.

Zygnema insigne, Kg. Common in stagnant and slow waters. Abundantiy conjugating and fruiting in September, when it is floating in dirty, yellowish, frothy masses.

Zygnema peliosporium. Common on dripping rocks and on the margins of cold, shaded springs. Fruits abundantly in November. A beautiful species.

Glœotrichia pisum, Thur. Common in Sand Coulee Creek on the leaflets of *Myriophyllum spicatum*, L. Doubtless occurs throughout the State. August to October.

Tolypothrix distorta, Kg. Everywhere in flowing water, growing cæspitose on the rocks. Filaments of our specimens measure 12–20 μ diameter. July to October.

Tolypothrix pulchra, Kg. Common as the last; on dripping rocks and on wet wood-work of dams, flumes and the like, submerged twigs, etc., in springs and streams. July to October.

Nostoc muscorum, Ag. Abundant on moss under dripping rocks.

Nostoc calcicola, Ag. Plentiful on the rocks at the "Great Fall" of the Missouri, which are kept constantly wet by the drifting spray.

Nostoc commune, Vauch. Common throughout the State. On the high foot-hills (5,000 to 7,000 ft.), on the alkaline plains and in the valleys. Extremely variable; in innudated places, where the water is kept warm by the sun's rays, this nostoc grows with marvelous rapidity, and frequently attains a diameter of ten inches and half a inch in thickness.

Nostoc sphæricum, Vauch. This small species is particularly partial to damp rocks in shady ravines.

Nostoc verrucosum, Vauch. Common at the Falls of the Missouri and in spring water impregnated with lime. In the fall of the year this species is torn from its hold on submerged rocks in the upper Missouri River, rises to the surface and floats to the shore in large numbers. Sometimes watery, hollow specimens, the size of bantam eggs are picked up. This species seems to take the place of *N. pruniforme*, Ag., with us.

Nostoc flagelliforme, Berk. & Curt. Very common on the alkali plains about Helena and thence southward and westward. As one walks carelessly along, this curious *Nostoc* looks like small weather-beaten, entangled tufts of black horse hair. Hitherto only reported from Texas. See Wood's "Contributions," p. 226, and Wolle's "Fresh-Water Algæ," p. 285. This species is so very distinct from all other known species that it could never be mistaken for any of them. It is frequently in company with the plains form of *N. commune*.

Sphærozyga polysperma. Common in open, muddy pools heated by the sun's glare; rising to the surface in small frothy, scummy masses. Ponds and semi-stagnant mud-bottomed parts of streams in the mountains and on the plains. June to November.

Cylindrospermum macrospermum, Kg. Common throughout; same general habit and duration as the last.

Leptothrix calcicola, Kg. Stratum dull æruginous, or dull ferruginous. Common everywhere on damp or dripping rocks. All the year.

Leptothrix æruginea (Kg.), Kirch. Doubtless common; but collected but once covering the sides of a large glass jar filled with spring water and left standing in the window for several weeks. The filaments formed a dense film. The side applied to the glass was somewhat variable, being bluish, faintly purplish or glaucous green; the other side was a very rich green. August, 1886.

In the waters of Montana diatoms are very numerous; not so much perhaps in number of species as in the vast and very palpable aggregate of individuals. They often cover such plants as *Cladophora* so completely as to obscure the character of their hosts, while even in mountain torrents, the boulders and lesser stones are covered with them so as to render the fording of a stream a slippery and, at times, even a dangerous task. Prof. C. Henry Kain has kindly examined our scanty collection in this branch. The following species are common and interesting:

Synedra ulna (Nitzsch.), Ehr. On or with *Spirogyra* and *Zygnema*, sp.; very common.

Cymbella gastroides, Kutz. Very common in cold, rapid streams, forming hemispherical, slippery, gristle-colored masses, with myriads of minute diamonds flashing on all sides when the sun shines clearly.

Fragilaria capucina, Desmaz., is also very commonly mixed with foregoing species. The entire list reported by Prof. Kain is as follows:

Synedra ulna (Nitzsch.), Ehr.

Synedra (*ulna*, var.) *Danica*, Kutz.

Meridion constrictum, Ralfs.; some specimens are quite near to *M. circulare*.

Diatoma hiemale (Lyng.), Heiberg, var. *mesodon*, Grun.

Melosira varians, Agardh.

Cymbella gastroides, Kutzing.

Cymbella cymbiformis, Ehr.

Cymbella cistula, Hempr.
Cymbella lanceolata, Ehr.
Encyonema ventricosum, Kutzing.
Eunotia lunaris (Ehr.), Grun., var. *excisa*, Grun.
Surirella angusta, Kutz.
Gomphonema acuminatum, Ehr.
Gomphonema Herculaneum, Ehr.
Gomphonema ventricosum, Greg.
Rhoicosphenia Van Heurckii, Grun.
Cocconeis pediculus, Ehr.
Cocconeis placentula, Ehr.
Epithemia turgida (Ehr.), Kutz.
Navicula varians, Greg.
Fragilaria capucina, Desmaz.

In concluding this article it were not well to forget the constant courtesy and practical assistance rendered us from time to time since 1885 by our venerable friend, the Rev. Francis Wolle, and by Dr. Wm. Albert Setchell, who have each done much towards determining our humble collections of Montana algæ, and towards encouraging our work in a region where all discouragement possible, until very recently, has been perpetually cast in our way.

Myriophyllum Farwellii, nov. sp.

By Thomas Morong.

A few months since Mr. O. A. Farwell, of Ypsilanti, Mich., sent to the Herbarium a specimen of *Myriophyllum*, collected in a small pond in Keweenaw County, Mich., which without much examination was referred to the form named by T. and G. *M. ambiguum*, var. *capillaceum*. A subsequent study of the specimen convinced me that in some particulars it was distinct from anything hitherto published, and a more complete suite of plants sent recently by Mr. F. has confirmed my impression. It more nearly resembles *M. pinnatum* (Walt.), (*M. scabratum*, Mx.) in the flowers and fruit than any other North American species, but it is sufficiently different both in habit and botanical characters to merit specific rank. The stems are all submerged, and the flowers produced in their axils under water. Mr. F. writes that although quite abundant and frequently much longer than the depth

of water in which they grow, the stems always curve over before reaching the surface and never protrude their tops into the air, a very unique habit so far as my experience with these aquatics goes. The outline of the stem and leaves is comparatively narrow, being about 2 cm. in breadth. Leaves scattered along the stem or in verticils or subverticils of 3s and 6s, pinnately parted, the divisions very finely capillary and in five to seven opposite or subopposite pairs, in the axils of which minute black spines often occur. Judging from the specimens furnished, it is dioecious, as I can find only pistillate flowers. Petals four, oblong, delicate, purplish in color, including four abortive stamens, which have silk-like filaments and minute, undeveloped anthers. Styles small, erect, plumosely stigmatic at the apex. The fruit is decidedly unlike that of *M. pinnatum* except in being scabrate. It is much larger than that, being, indeed, the largest of all the known species, varying in size from 2 mm. to 2½ mm. in length by about 1 mm. broad, while *M. pinnatum* has fruit not much over 1 mm. long by 1½ mm. in breadth. The carpels of the latter when fully developed are broadly two-winged on the back, the wings close together and strongly scabrate or sharply toothed, deeply grooved and smooth or slightly tuberculate between the wings, while those of the other have three, sometimes four rough tuberculate or slightly toothed ridges, and a comparatively shallow groove between them. When the ripe carpels separate, it will be seen that one or two of these ridges cross the back and one along each margin. Some of the fruits are on short stipes, a peculiarity which I have never noticed in *M. pinnatum*.

A new Liatris from North Carolina.

LIATRIS HELLERI.—Glabrous, with faint traces of pubescence on the pedicels and along the bases of the leaves; stem from a rootstock irregular in shape, leafy, fifteen or sixteen inches high; leaves linear, acuminate, diminishing in size and breadth upward, the lowest three lines wide in the middle, not punctate; raceme three to four inches long, loose, inclined to droop; heads six lines high, on short, slender, ascending pedicels, seven to ten-flowered; bracts of the involucre lax, not appressed, light green, with narrow scarious rarely purplish margins, not glandular-punctate, oblong-linear, the tips obtuse, or often so doubled in as

to appear acute, lowest short, ovate, acute or acutish; pappus plumose, scanty, weak, scarce half the length of the corolla-tube; achenes as long as corolla-tube and sparsely hairy.

Collected on the top of Blowing Rock Mountain, Watauga County, N. C., by Mr. A. A. Heller, August 18th, 1890, and found mixed with *L. graminifolia*, Willd., in his Nos. 81 and 82. The specimens of the latter were from lower elevations and are remarkable in having involucral bracts wholly destitute of glandular dots.

THOS. C. PORTER.

Central Michigan Cyperaceæ.

Last September, while collecting along the shores of Park Lake, six miles northeast of the college, my attention was attracted by an unknown *Eleocharis* growing in the shallow water. I had previously collected here, *Eleocharis olivacea*, *E. quadrangulata*, *E. palustris* var. *vigens*, *Cyperus Engelmanni*, and *Scirpus Smithii*; and now to be able to add another, and that an unknown *Eleocharis*, to my already overflowing vasculum, was good fortune indeed. Specimens afterwards sent to Dr. Sereno Watson, proved that *Eleocharis Robbinsii* was no longer confined in "shallow water, New England to Florida."

This species and *E. olivacea* are new to the flora of Michigan. On the shores of Pine Lake, two miles southeast of Park Lake, are found *Fimbristylis autumnalis*, *Scirpus Torreyi*, *Hemicarpha subsquarrosa*.

Carex umbellata was found in good fruit, May 5th, 1890, on bluffs along Grand River, ten miles west of the college. At the same time and place was collected *Carex communis*, var. *Wheeleri*. In former years, near Hubbardston, I had collected about a "Deer Lick" *Eleocharis pygmæa*, *E. rostellata*, and *Scirpus Olneyi*, and on bluffs near by the rarest of all Michigan Cyperaceæ—*Scirpus Clintonii*. In the same vicinity are found *Carex Richardsonii*, *C. Careyana*, *C. sychnocephala*, *C. platyphylla*, *C. triceps*, var. *hirsuta*, *C. aquatilis*, *C. retrorsa*, var. *Hartii*, *C. squarrosa*, and many other species. *Carex tenuiflora*, *C. pauciflora* and *C. Magellanica*, are found in a small sphagnous swamp near the college.

C. F. WHEELER.

Michigan Agricultural College.

Two Letters on Pinus Banksiana.

DR. N. L. BRITTON:

DEAR SIR.—I was observing a note of yours made in the BULLETIN some years ago, in regard to the size of *Pinus Banksiana*. The largest trunk I ever saw grew in the southeastern part of Grand Traverse County, Michigan. I have a cut three feet long in our museum; the top end, including the bark, is just one foot and a half in diameter, measured in either of two directions. It is perfectly sound. Several others nearly as large have been seen in various parts of the state.

At the mouth of the Au Sable River entering Lake Huron, in poor, sandy land, these trees grow very slowly. Many of them have a clean trunk for three to eight feet and a spreading top considerably like that of a well-shaped apple tree. I am told that this shape is common in Northern Minnesota. Large areas of sandy land in Crawford and Osceola counties are mainly covered with Jack Pines. In many places the trees are "stocky," twenty to forty feet high, with limbs near the ground and a wide-spreading, conical top. The people in the vicinity speak of them as "Black Jack Pines" or "Buckwheat Pines." They are making a comparatively rapid growth. In places where the soil is apparently a little better these trees are thicker and taller, with straight, slender, nearly cylindrical trunks forty to sixty or seventy feet high, and a diameter from eight inches to a foot or more. Such trees are called "Yellow Jack Pines," and as they have small bushy tops, make only a slow growth.

Many people believe that the pitch and leaves of *Pinus Banksiana* are poison to the ground, so that little else will grow near them. It is needless to say, there is no foundation for this notion.

Occasionally the trunks of good "Yellow" Jack, are used for cutting into lumber of an inferior quality, which is graded as "Norway" pine. The timber is also, to some extent, used for fence posts and stove wood.

I have seen this pine in the sand south of Lake Michigan in northwestern Indiana. W. J. BEAL.

AGRIC. COLLEGE, MICH., June 11, 1890.

PROF. J. S. NEWBERRY:

DEAR DOCTOR.—Miss E. Torrey brought me over yesterday some back numbers of the BULLETIN to look at. In the one for November, 1889, I find two papers (by E. L. Rand and J. H. Redfield) on the most southern station yet found for *Pinus Banksiana*. Turning to BULLETIN, August, 1882, I read: "Appalachia for June contains a few notes on the flora of the White Mountain region, and the statement is made that *Pinus Banksiana* has been detected on Welch Mountain (lat. 43° 55′ N. long. 71° 35′ W.)"

In Appalachia, June, 1882, J. H. Huntington writes (page 65): "There was also found on Welch Mountain the gray scrubpine, *Pinus Banksiana*. This is thought to be farther south than any point where it has been previously seen."

The facts in the case are as follows: August 9, 1881, my sister, Miss Edith W. Cook, being on Welch Mountain, Thornton, Grafton Co., N. H., found sundry stunted specimens of *Pinus Banksiana* on the mountain top (2,500 or 2,600 ft. high). She brought to me some branches and some of the lop-sided cones. I sent specimens of the same to Prof. Huntington, who was Councillor of Natural History to the Appalachian Club for that year. He issued the notice given in the "Appalachia" of the following June (1882), whence it was copied into the BULLETIN for August, 1882.

I know that botanists receive with difficulty the testimony of any eyes but their own; hence I sent specimen and cone to Prof. Huntington, who thus made the statement on his own positive knowledge. My sister and myself have never seen the tree elsewhere.

I enclose a little branch-end, and only wish I had one of the characteristic cones to send. But I have only one left, and must keep that as a proof for the sceptical.

Very truly yours,

LUCIA G. PYCHOWSKA.

HOBOKEN, N. J., April 27, 1890.

Botanical Notes.

A Strange Thing in Peppers. While examining some peppers for a new anthracnose, a peculiar structure was found within one of the fruits. In the ordinary mature pepper there is a fleshy columella rising from the base half way to the apex, upon which the seeds are borne. In the fruit in question this columella or compound placentæ was crowned by a small fruit not at all unlike a normal pod and was green. The accompanying outline engraving shows the position of the internal parts of the pepper with the young fruit in position. While it is interesting to go off into abstruse philosophy and endeavor to account for this strange method of secondary fruiting, the writer will restrain himself and leave the fact for those who may be inclined to speculate with. BYRON D. HALSTED.

Hybrid Plants.—Why should we assume that because a form of *Solidago serotina* is sterile, that it may, *therefore*, be a hybrid? Is the sterile form of *Cnicus arvensis* a hybrid? Possibly I have had as much experience by actual experiments in hybridizing as any one, but I never found hybrids any more sterile than other plants. On the other hand I have known of numerous cases of sterility, that are certainly not hybrids, so numerous as to considerably outweigh the latter. THOS. MEEHAN.

Melia Azederach.—We used to get seed from Alabama and Mississippi. The plants were easily killed by light winters. Seeds from Virginia give plants that prove hardy in Germantown, near Philadelphia. This is also true of *Magnolia grandiflora.* The facts are interesting as showing that the common belief in acclimation is not wholly a myth. THOS. MEEHAN.

The Pubescence of the Achenes of Solidago. I have examined a considerable number of specimens of *Solidago* with pubesent achenes. And in every case, so far, I have found the hairs of this pubesence *twin*, that is, there are always two cylindrical cells grown together longitudinally, and separate, if at all, only near the apex. JOHN M. HOLZINGER.

A Question for Teachers. How far shall we yield to the incursions of the new Latin and Greek pronunciations? For a long time I have held conservative ground as regards botanical names, but now I am forced by circumstances to partly adopt the heterodox modern notions. When my students speak of "Rahnoonkulahkeei" and "Istivation" (I spell the words phonetically) I now, with some mental effort, recognize a family of plants and a condition of the bud. Not without a shudder, however, do I respond in kind, still, I am convinced we must come to it, and we had better yield gracefully; at least there should be uniformity between teacher and pupil.

Brown University, Mar. 17, 1891. W. W. BAILEY.

Still Further Notes on the Flora of the Rangeley Lakes, Maine. I have read with much interest the articles in the BULLETIN of Oct. '89, and Feb. '90, by Mr. L. N. Johnson and E. L. Rand, Esq., and feel impelled to send an additional list of plants which I collected there in the months of July and August, thereby contributing thirty-seven new ones to the published list:

Caulophyllum thalictroides; Brasenia peltata; Dentaria diphylla; Stellaria borealis; Rhamnus alnifolia; Acer Pennsylvanicum; Acer spicatum; Trifolium agrarium; Rosa nitida; Potentilla palustris; Cornus Canadensis; Galium trifidum, var., *pusillum; Solidago macrophylla; Inula Helenium; Tanacetum Huronense; Vaccinium Vitis-Ideæ; Moneses grandiflora; Pyrola minor; Mentha Canadensis; Scutellaria lateriflora; Scutellaria galericulata; Rumex sanguineus; Microstylis monophyllos; Corallorhiza innata; Listera cordata; Habenaria bracteata; Habenaria dilatata; Habenaria obtusata; Habenaria orbiculata; Habenaria fimbriata; Smilax rotundifolia; Trillium erectum; Juncus effusus; Botrychium simplex; Botrychium lanceolatum; Botrychium matricariæfolium; Ophioglossum vulgatum.*

KATE FURBISH.

Notes from Long Island. The following plants have been found by me growing without cultivation, though some have undoubtedly recently escaped, and are not permanent.

In Cypress Hills Cemetery, *Muscari botryodies, Bellis perennis, Hieracium aurantiacum*, which I also found common in

fields at Summit, Schoharie Co., N. Y., and a friend found it at Saratoga. At New Lots I have seen young trees of *Pawlonia* growing along fence rows; *Medicago sativa* in an uncultivated field, and *Trifolium hybridum* is common, as it is in Brooklyn and elsewhere on the western part of Long Island. At Fresh Pond is a patch of *Stellaria graminea*. At Maspeth *Chelidonium majus* is permanent. My wife found *Trifolium incarnatum* growing in an open field on Shelter Island. *Apium nodiflorum* was found at Forbell's Landing, probably not established.

Asclepias obtusifolia, *Tephrosia Virginiana* and *Euphorbia Ipecacuanhæ* are common in Woodhaven; *Kalmia latifolia*, *K. angustifolia* and *Calopogon tuberosus*, forma *albiflorus*, occur at Forbell's Landing, as also *Lysimachia thyrsiflora*, *Gerardia purpurea*, forma *albiflora*, *Sabbatia stellaria*, forma *albiflora*, *Aster concolor* and *Aster Nova-Angliæ*, forma *albiflora*. *Liparis liliifolia* and *Aralia hispida* occur in Cypress Hills Cemetery.

GEORGE D. HULST.

Eatonia Dudleyi, *Vasey*, *in Connecticut.* This grass was found by the writer, in May, 1890, near Shelden's Cove, in the town of Lyme. It grew in fair abundance upon wooded slopes, bordering the creek. This species has not hitherto, so far as I know, been reported from New England. I have to thank Dr. Watson and Prof. Eaton, for confirming the identity of specimens from this locality. CHARLES B. Graves, M. D.

NEW LONDON, CONN.

A Correction. In Mr. Fernald's list of Maine plants, April BULLETIN, *Hypericum Canadense*, var. *minimum*, should be omitted. [Eds.]

Reviews of Foreign Literature.

Protoplasmic Union between the Neighboring Elements of the Plant.—In the *Botanische Zeitung*, beginning January 2d, 1891, and ending January 30th, is a long article by F. Kienitz-Gerloff with the above title. It is much too long to give a fair idea of its contents in the space allotted the reviewer, but a summary of his results and conclusions is as follows: After explaining the methods of investigating, a long list of plants is given in which this continuity of protoplasmic threads was observed. The list

begins with the Hepatics and ends with the Compositæ. He gives the two theories regarding the function of these threads, first, that they serve as conductors of dynamic stimulus, second, as a means for conducting the various food elements to the different parts of the plant.

According to the first, the sieve-tubes and their contents correspond to the nerves of the animal. He gives the opinions of Pfeffer, Haberlandt, and many others in favor of this theory, and quotes from Pfeffer that even the cell wall may contribute to this effect by the motion of its particles uniting with that of the protoplasma molecules. All these authors agree, in general, that this conduction of stimulus is one function of the continuous protoplasmic threads. There is, however, much less unanimity in regard to the second theory. Various objections are quoted; among others, the exceeding fineness of the perforations in the wall through which the threads pass. The author thinks this objection of little value, even if it were not possible to show in many cases that the perforations were of considerable size.

He says that if we discard this theory, which, in general, has reference to the passage of organic material, we must suppose this material finds its way through much finer channels, namely, between the molecular interstices of the wall, either by filtration or osmosis. Here is given the experiment of De Vries to show that by diffusion alone, even those substances conveyed the most rapidly, e. g., cane-sugar and salt, would find too slow transport to meet the needs of the plant. According to this experiment it would take a milligram of salt in a ten per cent. solution three hundred and nineteen days to move the distance of a meter in water. Albuminous substances would require fourteen years.

By comparing the results obtained by his own studies with those of many others, the author decides that an important function of these threads is the transport of organic matter to various parts of the plant. Furthermore, that they may serve as conductors of stimulus, as by their means the whole protoplasmic contents may be withdrawn from one part of the plant to another. This latter view, he says, may account for the entire lack of protoplasm in the ducts and schlerenchymatic cells whose walls are completed in thickness. As soon as this thickening process

is completed the protoplasm is withdrawn to neighboring cells, where it may be of further service in the plant economy. The same hypothesis also explains the cause of the sudden disappearance of protoplasm in the autumn leaves of deciduous trees. The contents of the leaf cells, on the approach of cold or other disagreeable environment, suddenly wander back through the petioles into the stem, just as the plasmodium withdraws an arm when it comes in contact with anything disagreeable.

This view, he says, is sustained by the fact that among the large numbers of fallen leaves already withered and sere, which he examined, no trace of protoplasm was found except in the guard cells of the stomatæ. Here occurred both protoplasm and chlorophyll grains. In all his previous examinations of healthy leaves, no trace of protoplasmic union between these cells and those surrounding them was found. Therefore it would be impossible for them to lose their contents by the means suggested. In answer to the question, how they obtained their supply in the first place? he says they may have received protoplasm and chromatophores when first cut off from the neighboring epidermal cells, and that probably these contents were at first connected with those of the neighboring cells, and later the perforations were closed. According to this notion they must have been obliged to furnish all their own organic nourishment after this separation occurred. The reason for this isolation he finds in the supposition that were they subject to the otherwise universal exchange of organic material they would, at times, be deprived of turgor-producing substances, so fail in their office of opening and closing.

In conclusion, he states that in germinating seeds no union exists between the protoplasm of the embryo and that of the neighboring cells, neither is it found between the haustoria of parasitical plants and the cells of their hosts. This facts offers no objection to his view, as according to it, only the organic material, which is insoluble in water, is transferred by these protoplasmic threads. Wortmann has shown that the change of starch to a material soluble in water is accomplished by diastase only in the holders of reserve material, such as starch-holding seeds, etc. Accordingly solutions occurs here which may feed the plant by osmotical processes.

No union was found to exist between the cells of low plants where each cell is able to perform all the metabolic functions. An exception to this statement must perhaps be made of the *Volvox* and certain others of this family. The fungi were not examined.

E. L. G.

Recent Literature on the Diatomaceæ.

Diatomaceæ of North America. Rev. Francis Wolle.

There has long been an urgent demand for a work upon diatoms at a reasonable cost. Dr. Wolle has met this want admirably in the present work. Students of the Diatomaceæ will also appreciate the work which the author has done in bringing together a large number of illustrations that have heretofore been almost inaccessible, for it is well known that the literature bearing upon the subject is scattered and costly. A valuable feature is the reprinting from "The Lens," of Prof. H. L. Smith's "Conspectus of the Families and Genera of the Diatomaceæ." It would have been well, however, if Dr. Wolle had refrained from specifying certain genera in the Conspectus, as not North American. Several of the genera thus indicated are undoubtedly North American.

The plates, 112 in number, are well executed. It is to be regretted that a rather large list of errata in the text has been rendered necessary, owing to the author's serious illness, while the work was in course of publication.

Atlas der Diatomaceen-kunde. A. Schmidt.

Fascicles 39 and 40 have just been issued, thus bringing the work up to Plate 160. Sendai, Oamaree, and Atlantic City, each contribute a number of new species. The continued disability of the veteran diatomist, Herr Grunow, has prevented his assistance in preparing the present number.

On the Structure of the Pleurosigma Valve. T. F. Smith, F. R. M. S.

Diatom Structure—The Interpretation of Microscopical Images. Jacob D. Cox, LL.D., F.R.M.S. (Journal of New York Microscopical Society, Vol. vii. No. 2. April, 1891).

Recent improvements in microscopical objectives have rendered possible far more accurate information in regard to the

character of diatom structure than was formerly possessed. The two papers mentioned are valuable contributions to the literature of the subject. Mr. Smith's paper is accompanied by two plates, containing twenty excellent phototype illustrations.

Le Diatomiste. J. Tempére, Paris.

The fourth number of this serial, just issued, is entirely devoted to a monograph upon the genus *Pleurosigma*, by M. H. Peragallo. The article embraces sixteen pages of text, and is accompanied by five plates, containing one hundred and nine figures. A synoptical table is given, which is so concise that it is likely to afford material aid in tracing species. C. H. K.

Index to Recent Literature relating to American Botany.

Abies religiosa. (Gard. Chron. ix. 304, figs. 69, 70).

A Botanical Excursion into Lycoming and Luzerne Counties, [*Pa.*] (College Student, xi. 108-110).

An interesting account of an autumn expedition by Messrs J. K. Small and A. A. Heller, students in Franklin and Marshall College. In the list of plants collected we note the discovery of *Aster concinnus*, Willd., as of special interest.

Apodanthes—Two Undescribed Species of. B. L. Robinson. (Bot. Gaz. xvi. 82-84, Pl. ix).

Descriptions and representations of *Apondanthes Pringlei*, Watson, on branches of *Dalea frutescens* and *A. globosa*, Watson, on *Bauhinia lunarioides*, both collected by Mr. C. G. Pringle, in the Sierra Madre, near Monterey.

Bessera elegans. (Gard. and For. iv. 124, f. 24).

Black Rust of Cotton; a Preliminary Note. George F. Atkinson. (Bot. Gaz. xvi. 61-65).

A discussion of the parts played in the above disease by *Cercospora Gossypina, Colletotrichium Gossypii, Macrosporium nigricanticum*, [n. sp.], *Phyllosticta Gossypina* and *Alternaria* sp.?

Cuscuta Glomerata with its Host—The Union of. W. C. Stevens. (Trans. Kans. Acad. Sci. xii. 163, 164, illustrated).

Erythræa Pringleana Wittr. nov. spec. Veit Wittrock. (Bot. Gaz. xvi. 85). Based on C. G. Pringle's, No. 2595.

Mr. Pringle adds the following note: "It may be well enough to state in this connection that what was distributed as '*Microcala*

n. sp.,' (No. 2598), is *Schultesia Mexicana*, Watson, n. sp., soon to be published."

Evolution in Leaves. Mrs. W. A. Kellerman. (Trans. Kans. Acad. Sci. xii. 168-173, illustrated).

This is a statement of some facts observed in the lobing of leaves and development of stipules, followed by a discussion of the significance of the facts in relation to the forms of leaves. *Rubus villosus, Vitis quinquefolia, Rhus Toxicodendron, Sambucus Canadensis, Negundo aceroides, Symphoricarpus racemosus* and *Cimicifuga racemosa* are made use of as examples, and *Rubus, Rosa, Tecoma* and *Vitis*, are the subjects of illustration. There is also a list of plants designed to show that large leaved plants harbor fewer insects than finely divided ones, and that, therefore, the evolution from entire to dissected leaves was not due to an attempt of the plant to escape from the ravages of insects. The author is manifestly in sympathy with the views of Grant Allen, that leaves become dissected in their efforts to obtain air and sunlight. A. H.

Flora Franciscana. Au attempt to Classify and Describe the Vascular Plants of Middle California. Edward L. Greene, (Part I, 8vo. pp. 128. San Francisco. Issued March 30, 1891).

A portion of the collected results of Prof. Greene's critical studies of the Flora of this part of Western America, extending over many years, is now, happily, given to the world. It is the first time that he has essayed to present a descriptive synopsis of the flora of a region, or anything in the nature of monographs of genera, all his available time for writing, up to the present, having been needed for the separation and characterization of new or obscure species, the discussion of questions of nomenclature, and other work of a non-consecutive character on the plants of what has been, botanically, a little known area. American botanists have awaited the production of the work now noticed, with impatience, for it has been felt that he, and he only, could satisfactorily bring together the multitude of facts and observations which he has recorded in the publications of the California Academy of Science, Pittonia and the BULLETIN. Departing entirely from the long-followed sequence of natural orders established by the elder DeCandolle, the Leguminosæ are placed

first, the orders included in this part being arranged in the following sequence: Leguminosæ, Drupaceæ, Pomaceæ, Rosaceæ, Calycantheæ, Juglandeæ, Rutaceæ, Sapindaceæ, Anacardiaceæ, Celastrineæ, Rhamneæ, Tithymaloideæ, (the name antedating the equivalent Euphorbiaceæ), Polygaleæ, Lineæ, Geraniaceæ, Malvaceæ, Hypericeæ, Elatineæ, Frankeniaceæ, Caryophylleæ. It will be seen that the orders of the artificial division Apetalæ or Incompletæ, are inserted among the polypetalous, or better choripetalous orders, where their affinities naturally place them, and this is a great advantage in arrangement. Prof. Greene follows Bartling's ideas in the main, believing the Leguminosæ to be the most complex plants.

The following new species are described and new binomials proposed: *Vicia linearis* (*Lathyrus linearis*, Nutt; *V. Americana*, var. *linearis*, S. Wats. *V. sparsifolia*, Nutt. appears to be a prior name for the same plant); *Vicia Californica; Amorpha hispidula; Trifolium amœnum; Trifolium roscidum; Lupinus longipes; Lupinus nemoralis; Amygdalus fasciculata* (Torr); *Cerasus Californica* (*Prunus emarginata*, Brew. and Wats.), *Amelanchier glabra; Amelanchier pallida; Basilima Millifolium* (Torr); *Schizonotus ariæfolius* (Smith); *Potentilla biennis; Rosa Sonomensis; Rosa gratissima; Ceanothus rugosus; Euphorbia rugulosa* (Engelm); *Erodium Californicum; Flærkea rosea* (Hartw.); *Flærkea alba* (Hartw.); *Sidalcea secundiflora; Malvastrum Parryi; Malvastrum fasciculatum* (Nutt.); *Malvastrum orbiculatum; Malvastrum multiflorum; Tissa Clevelandi*, and four under *Alsinella*, the only pre-Linnæan generic name taken up to replace one used by Linnæus. We wish Professor Greene had accepted *Sagina*.

As to nomenclature, original specific names are of course rigidly maintained. The parenthetic citation of authors is, however, not favored, although used to some extent. Generic names used by pre-Linnæan authors and adopted by Linnæus are accredited to the old writers even as far back as Dioscorides and Pliny. This practice has appeared to us to be straining a point for history's sake and is open to criticism on the ground that the ancients did not use the names in the generic sense of Tournefort, Linnæas and others of about their time, but in most cases, at

least, as mere appelations for plants. It would seem on the whole best to adopt the plan of Bentham and Hooker, not to go back of Linnæus. If it is thought desirable to refer to the ancient history of the science, that can best be treated by itself, and Professor Greene's great learning in that topic would provide him material for a most valuable and interesting volume.

How can he, in any event, safely credit a name to Dioscorides or Theophrastus? They, surely, did not originate such terms as *Astragalus* and *Sorbus*, but merely recorded what certain plants were called in their time. Some of these terms must be as old as spoken language, and probably a number of them exist on the monuments of ancient Egypt. N. L. B.

Flora of Kansas—Additions to the. B. B. Smyth. (Trans. Kans. Acad. Sci. xii. 105–119).

This is stated to be in the nature of a supplement to the catalogue of Kansas plants prepared by Prof. J. H. Carruth about fourteen years ago. The title of the paper should include the term "Subtractions from" as well as "Addition to" the flora, as the author begins with the excellent plan of eliminating 160 species which have been credited to the State but need confirmation, leaving 1,355 species, to which are to be added the 355 Anthophyta and 16 Pteridophyta included in this paper. A preliminary list of 96 mosses is also added, so that the totals for the known flora of the State now stand: Anthophyta 1,666, Pteridophyta 40, Musci 96. The nomenclature used is not up to modern standards, and we are inclined to deprecate such fine distinctions as are included under the terms "escaped," "escaping," "escaped slightly," "escaping slightly," "escaping sparingly" and "trying to escape," but localities are freely noted and the work will undoubtedly be of value to every botanical collector in Kansas. A. H.

Flowers and Insects, VI. Chas. Robertson. (Bot. Gaz. xvi. 65–71).

The flowers which are the subjects of this contribution are those of *Triosteum perfoliatum, Cephalanthus occidentalis, Lobelia spicata, L. leptostachys, L. syphilitica, L. cardinalis, L. cardinalis* ×*syphilitica*, (in which the corolla is described as "shorter and broader and the lobes shorter and firmer than in *L. cardinalis* and

. . . of a deep reddish or crimson-purple."), *Campanula Americana* and *Apocynum cannabinum.*

Fossil Wood from the Erian (Devonian) of New York and Kentucky—Note on Specimens of. Wm. Dawson and D. P. Penhallow. (Can. Rec. Sci. iv. 242–248, pl. I).

The claim is made that one of the specimens examined represents the genus *Kalymma* of Unger, not previously recognized in America. The specimens in question were found in the Genessee shales of Moreland, Ky., and were subjected to microscopic examination. *Kalymma grandis* is figured—showing transverse section of stem, natural size and enlarged sections of vascular bundles, with wood cells, parenchyma, sclerenchyma cells, etc. The other species determined are *Dadoxylon (Cordaioxylon) Clarkii*, and *D. Newberryi.* The authors incidentally discuss the relationship between the genera *Cordaites, Cordaioxylon, Dadoxylon, Araucarites, Aporoxylon* and *Palæoxylon.* A. H.

Fungi—Two New Species of Montana. J. B. Ellis and F. W. Anderson. (Bot. Gaz. xvi. 85, 86, pl. X).

Explanation and plate belonging to the description of *Spirodesmium sorisporioides* and *Aecidium Liatridis* published on p. 47 of the Gazette for Feb. 1891.

Fungous Diseases of the Grape and other Plants and their Treatment. F. Lamson-Scribner. (8vo, pp. 134, Little Silver, N. J. 1890, illustrated).

Professor Scribner has brought together accounts of several fungous diseases of grapes in this little book, written in a clear and popular style. It includes a general description of Fungi and detailed information about the Black-rot of Grapes (*Læstadia Bidwellii*); the Bitter-rot (*Greeneria fuliginea*); the Brown-rot (*Peronospora viticola*); the Powdery Mildew of the Vine (*Uncinula Ampelopsidis*); the Grape-leaf Blight (*Cladosporium viticolum*); the Root-rot (*Agaricus melleus* and *Dermatophora necatrix*); Bird's-eye Rot (*Sphaceloma Ampelinum*) and Anthracnose. Besides these grape pests there are described the Black-rot of the Apple (*Macrophoma malorum*); Apple-rust and Cedar Apples (*Gymnosporangium macropus*); Apple-scab (*Fusicladium dendriticum*); Pear-scab, caused by the same fungus; the crack-

ing of the pear (*Entomosporium maculatum*); Plum-rot (*Monilia fructigena*); Black-Knot of the Plum and Cherry; Leaf-spot Disease of the Plum and Cherry (*Septoria Cerasina*); Powdery Mildew of the Cherry (*Podosphæra Oxyacanthæ*); Peach-leaf Curl (*Taphrina deformans*) and several others.

The work will prove an important one for fruit growers, and can be had for seventy-five cents, bound in cloth, from the J. T. Lovett Co., at the place of publication. It is well illustrated and embellished by a portrait of the handsome and distinguished author. N. L. B.

Garrya elliptica. (Garden, xxxix. 261; illustrated).

Hackberry Branch Knot—Note on the Distribution and Ravages of the. W. A. Kellerman. (Trans. Kans. Acad. Sci. xii. 101–104, illustrated.)

A description of the affliction to which *Celtis occidentalis* is so generally subject, from the attacks of a gall mite (*Phytopus*) with the assistance of the fungus *Sphærotheca phytoptophila.*

Hydrastis Canadensis—A Contribution to the Life History of. Homer Bowers. (Bot. Gaz. xvi. 73-82, pl. viii.)

List of Plants found in Cherokee County, Texas—A Partial. Mrs. A. L. Slosson. (Trans. Kans. Acad. Sci. xii. 62, 63).

A list of about 170 species, chiefly remarkable for the large number of typographical errors contained in it.

Lygodium palmatum. (Garden, xxxix. 265, illustrated).

Masdevallia macrura. (Bot. Mag. t. 7164).

Notes on North American Trees—XXV. C. S. Sargent. (Garden and Forest, iv. 147-148).

Professor Sargent concludes that the eastern Sugar Maple should bear the name *Acer barbatum*, Michx. (1803), regarding the *A. saccharum*, of Marshall (1785), as not safely referable to the tree, while the Linnæan name *A. saccharinum* (1753), belongs to the Silver Maple. It appears to us that Marshall's name can safely be attributed to the Sugar Maple, first, because it is the principal sugar-producing species, and thus the one to which the designation *saccharum* would naturally be applied by one entirely familiar with the native maples, which Linnæus evidently was not; second, because Marshall notes that "it flowers in the manner of the Red Maple," indicating the production of flowers

from lateral buds, as contrasted with the Striped Maple and Mountain Maple, which produce terminal racemes; third, because he describes the flowers as of an "herbaceous" color, and they certainly are yellowish-green; and fourth, because it is the only one of the six species described by Marshall which can apply to the Sugar Maple, with which we think it entirely safe to assume that Marshall was well acquainted. Professor Sargent expresses his conviction that *Acer grandidentatum*, Nutt. of the Rocky Mountain region, is not specifically distinct, and that the same is true of *A. nigrum*, Michx., a position in which we do not believe he will be generally supported. He follows recent European authors in reuniting *Negundo* with *Acer*, for which there appears to be abundant reason, and refers *N. Californicum* to *A. Negundo* as a variety, which does not seem to us to be as defensible.

N. L. B.

Peronosporaceæ—First Addition to the List of Kansas. W. T. Swingle. (Trans. Kans. Acad. Sci. xii. 129-134).

Species are enumerated under the genera *Cystopus*, *Plasmopora*, *Bremia* and *Peronospora*. The host-plants are given under each species. Eleven different kinds of type are used in this article, partly in order to emphasize new facts, and the result is a somewhat startling arrangement which, however, might not attract so much attention but for its novelty. We candidly confess that to us the appearance is rather confusing than otherwise.

A. H.

Periodicity in Plants. B. B. Smyth. (Trans. Kans. Acad. Sci. xii. 75-81).

The author begins by treating the subject of annual periodicity in development, and gives examples of individual eccentricities in trees, as to date of opening the leaves, blossoming, fruiting, etc. The daily motions of plants next receive the author's attention, and from them is constructed "A Floral Clock for Kansas" which begins with "2 to 3 A.M. . . . . *Convolvulus sepium;* closes next evening" and terminates with "11 P.M. . . . . *Cereus speciosissimus;* wilts at 2 A.M." In addition to the facts embodied in the "Clock" there are several philosophical speculations scattered through the article, such as:

"Plants can feel, of course; but do they actually see? * * * We are not aware that we are cognizant of light by any organ except our eyes, and we call that seeing. The plant is cognizant of light in its leaves, in all their modifications. Is it not, at least, analagous to seeing? Is it heresy to say that, so far as light is concerned, plants can see?" The paper concludes with a discussion of twining and climbing plants, heliotropism, etc., and we are also told, in regard to the leaves of certain species of *Euphorbia* that "as soon as the dew begins to fall they fold together in pairs, as a child folds its hands to pray, * * * and remain thus all night." So far as the "clock" is concerned the facts embodied in it are of undoubted interest and value. A. H.

Pinus insignis. (Gard. Chron. ix. 337, f. 77 and plate).

Report of the Botanist of the California State Board of Forestry. J. G. Lemmon. Third Biennial Rep. Cal. State Board Forestry, 73-212, Sacremento, 1890).

This important paper by Prof. Lemmon is taken up mainly with an extended description of the Californian Coniferæ. It is prefaced by chapters on the general features of the group on "development the basis of classification," on "creative energy and development," and schemes of classification. The main part contains generic and specific descriptions of all the native and introduced species known to occur in California (except the pines, which were treated in a previous report), most of them illustrated by photographs taken by the author. The descriptions are drawn in a popular way, and accompanied by many interesting and valuable notes gleaned from Mr. Lemmon's long experience in investigating the western flora. The nomenclature adopted by Prof. Sargent is upheld, original specific names being maintained. Several new varieties are described.

Persons desiring the report may obtain it by enclosing 10 cents to Prof. Lemmon at 1015 Clay St., Oakland, Cal., as also copies of his preceding report on "Pines of the Pacific Slope" for the same sum. N. L. B.

Silver Maple—The. (Gard. and For. iv. 134, 135 f. 26.)

Popular description and representation of *Acer saccharinum*, or, as it is more generally known, *A. dasycarpum.*

Sorghum Smuts—Notes on. W. A. Kellerman and W. T.

Swingle. (Trans. Kans. Acad. Sci. xii. 158, 159, illustrated).

Descriptions of *Ustilago Sorghi and U. Reiliana*, the latter figured.

Vorläufige Mittheilungen über die von mir im Jahre 1888 *in Nord Amerika gesammelten neuen Arten und Varietäten der Laubmoose*, von Dr. Julius Röll. (Sep. Abd. Bot. Cent. no. 51, 1890, pp. 13).

The plants collected by Dr. Julius Röll have been named by various specialists. This installment includes twenty-three new species and twenty new varieties and sub-species of mosses named by Renauld and Cardot, Venturi, Müller, Brotherus and C. R. Barnes, the genera being *Dicranum*, *Barbula*, *Timmiella*, *Grimmia*, *Guembelia*, *Scouleria*, *Ulota*, *Orthotrichum*, *Pohlia*, *Bryum*, *Mnium*, *Myrinia*, *Pseudoleskea*, *Fontinalis*, *Neckera*, *Camptothecium*, *Brachythecium*, *Raphidostegium*, *Amblystegium*, and *Hypnum*. Suspecting *Mnium Röllii*, Vent. to be the same as *Bryum lucidum* (BULLETIN, Dec. 1889), I sent specimens of the latter to Dr. Brotherus and he confirms my suspicion. *Orthotrichum stenocarpum*, Vent. is also antedated by *O. lonchothecium*, CM. and K., Macoun's Canadian Mosses, No. 497, which I believe to be the same as Austin's *O. Macouni*, BULLETIN vi. 343, 1879. It is also worthy of note that *O. strictum*, Vent. subspec. nov. of *O. Lyellii*, is evidently only *O. Pacificum*, Hpe. which is a rigid, dark form of that species. E. G. B.

Winter Aspect of Trees. J. Walton. (Vick's Mag. xiv. 120-124; illustrated).

Fagus ferruginea, *Acer saccharum*, *Populus Canadensis* and *Robinia pseudacacia* are the subjects specifically treated. The representations of the trees are worse than poor, they are misleading and it is a pity that an article which could be made of interest and value should be spoiled by such illustrations. The previous contribution was open to the same criticism and we would suggest that hereafter the camera is the only safe instrument to use in case illustrations are desired. The author concludes with a description of how to calculate the height of trees.

Yuccas of California—The Arborescent. S. B. Parish. (Gard. and For. iv. 135, 136.)

On account of *Yucca brevifolia*, *Y. baccata* and *Y. briarfolia*.

Proceedings of the Club.

WEDNESDAY EVENING, MARCH 25TH.

The Vice-President in the Chair and twenty-three persons present.

The paper announced "On some new Species of *Nitella*," was presented by Dr. Allen. Two new species, *N. Blankinshipii* and *N. stricta*, were exhibited and described, and their relation to known species commented upon.

Dr. Allen also remarked at length on the desirability of establishing a uniform method of botanical pronunciation, alluding especially to the three methods of Latin pronunciation in use at the present time. The subject was further discussed by Dr. Morong and Dr. Britton.

Dr. Morong spoke concerning the life and work of Rafinesque, remarking on his genius and acute powers of discrimination, stating that he agreed with Professor Greene that many more of the genera and species described by him must be recognized. He made especial mention of the recent publication of Rafinesque's will, by Mr. Thos. Meehan, in the columns of the *Philadelphia Ledger*.

Dr. Britton showed a specimen of *Eleocharis atropurpurea*, found by Dr. Wibbe in Fillmore Co., Nebraska, greatly extending its range to the north.

TUESDAY EVENING, APRIL 13TH.

The President in the Chair and twenty-eight persons present.

The desirability of uniform botanical pronunciation, brought up by Dr. Allen at the previous meeting, was commented upon by Judge Brown.

Dr. Morong presented the announced paper of the evening, "A Trip on the Pilcomayo River," giving an account of his experiences during a six months' journey in northwestern Paraguay and describing the floral features of the region.

Dr. Allen showed flowering specimens of *Pyxidanthera barbulata* received from Miss Farrington from Lakewood, N. J., and a number of vernal plants sent by Miss Gordon of Aiken, S. C., among them *Iris verna*, *Phlox amœna*, *Phlox subulata* and *Chrysogonum Virginianum*, the latter reported as the earliest flower of that region.